

Interdisciplinary Approach to Emergency Care: Integration of Radiology, Physiotherapy, and EMT Services in Acute Trauma Management

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Abstract:

Acute trauma management requires a multidisciplinary approach to ensure effective and timely care. This paper explores the integration of radiology, physiotherapy, and emergency medical technician (EMT) services in trauma care, highlighting the importance of interprofessional collaboration. Radiologists play a critical role in diagnosing injuries through imaging techniques such as X-rays, CT scans, and MRIs, which guide treatment decisions in trauma cases. Physiotherapists contribute to early mobilization and rehabilitation, which improves recovery outcomes and reduces complications like muscle atrophy. EMTs are often the first responders in trauma situations, responsible for stabilizing patients and ensuring safe transport to healthcare facilities. This interdisciplinary collaboration is essential, particularly in complex cases such as spinal cord injuries and geriatric trauma, where timely intervention can significantly improve patient outcomes. Despite the clear benefits, challenges such as a lack of standardized protocols and varying levels of training among healthcare professionals hinder the implementation of effective interprofessional collaboration. Addressing these challenges through improved communication and training can optimize trauma care and reduce mortality and complication rates. This paper concludes that an integrated approach to trauma care, involving radiologists, physiotherapists, and EMTs, is vital for improving patient outcomes in acute trauma management.

Keywords: Interdisciplinary collaboration, trauma management, radiology, physiotherapy, emergency medical technicians, early mobilization, acute care.

Introduction

Trauma care is a complex and dynamic field that requires a multidisciplinary approach to effectively manage the wide array of injuries and conditions resulting from accidents or violence. In emergency settings, particularly in acute trauma cases, rapid and accurate assessment followed by appropriate interventions is essential to improve patient outcomes. The integration of various healthcare disciplines—such as radiology, physiotherapy, and emergency medical technician (EMT) services—forms the backbone of this approach, ensuring that the patient receives comprehensive and timely care at every stage of treatment. Acute trauma management, especially in cases involving spinal injuries, fractures, or internal injuries, necessitates the collaboration of multiple healthcare professionals. **Radiologists** provide critical diagnostic imaging that guides treatment decisions. **Physiotherapists**

contribute to early mobilization and rehabilitation, which has been shown to reduce complications such as muscle atrophy and improve recovery outcomes. EMTs, as the first responders, play a pivotal role in stabilizing patients and ensuring that they reach healthcare facilities with minimal deterioration in their condition. This paper explores the interdisciplinary approach to emergency trauma care, focusing on the integration of radiology, physiotherapy, and EMT services, and how this collaboration enhances patient outcomes in acute trauma management.

The Role of Radiology in Acute Trauma Management Diagnostic Imaging in Trauma Care

Radiology is a cornerstone in the diagnosis and management of trauma patients. Imaging techniques such as X-rays, computed tomography (CT) scans, and magnetic resonance imaging (MRI) provide detailed insights into the extent and nature of injuries, particularly in cases of suspected spinal cord injuries, fractures, and internal bleeding (Lee et al., 2019).

Radiologists are responsible for interpreting these images and collaborating with other healthcare professionals to develop a treatment plan. The use of imaging is crucial for identifying life-threatening conditions early, thus enabling timely interventions.

In trauma cases, particularly where spinal injuries are suspected, accurate and prompt imaging is necessary to avoid further injury during transport or initial treatment. According to Oteir, Smith, Jennings, and Stoelwinder (2014), the prehospital management of suspected spinal cord injuries relies heavily on the EMT's ability to minimize movement and stabilize the patient until imaging can confirm the extent of the injury. This highlights the importance of radiology in confirming initial assessments and guiding subsequent care.

Streamlining Radiology Workflow for Multidisciplinary Teams

The role of radiologists in multidisciplinary trauma teams has evolved with the development of web-based systems that streamline workflow and enhance communication between healthcare professionals. Choi and Filice (2020) describe a web-based system that allows radiologists to share images and notes with other members of the trauma team in real-time. This system improves the efficiency of multidisciplinary conferences, ensuring that all team members have access to the most up-to-date information. In trauma care, where decisions often need to be made quickly, such systems can significantly improve the coordination of care and patient outcomes.

The integration of these systems into trauma care also supports the educational aspect of radiology, as these platforms can be used to create teaching files that help train future radiologists and other healthcare professionals (Choi & Filice, 2020). This ongoing education is critical in maintaining high standards of care in trauma management.

Physiotherapy's Contribution to Early Mobilization and Rehabilitation Importance of Early Mobilization in Trauma Patients

Physiotherapy plays a vital role in the early mobilization and rehabilitation of trauma patients, particularly those with injuries requiring prolonged bed rest, such as spinal cord injuries, fractures, or severe soft tissue damage. Early mobilization has been shown to improve outcomes by preventing complications such as deep vein thrombosis, muscle atrophy, and pressure ulcers (Hashem, Nelliott, & Needham, 2016). In the intensive care unit (ICU) setting, early rehabilitation has demonstrated a reduction in the duration of mechanical ventilation and ICU stays, allowing for faster recovery and return to functional independence.

Hashem et al. (2016) emphasize the importance of early mobilization in the ICU, noting that prolonged bed rest can exacerbate muscle wasting and delay recovery. By integrating physiotherapy early in the care continuum, trauma teams can mitigate these risks and improve long-term outcomes. Physiotherapists work closely with radiologists and other team members to understand the extent of a patient's injuries and develop appropriate rehabilitation plans.

Advanced Musculoskeletal Physiotherapy in Trauma Care

The role of physiotherapists has expanded in recent years, with the development of advanced musculoskeletal physiotherapy (AMP) roles that allow physiotherapists to take on more responsibilities in the management of trauma patients. According to Harding, Prescott,

Sayer, and Pearce (2015), AMP physiotherapists are trained to perform advanced assessments, develop treatment plans, and even prescribe certain interventions, reducing the burden on other healthcare professionals and improving the efficiency of trauma care.

In trauma cases, AMP physiotherapists can assess the patient's musculoskeletal injuries, collaborate with radiologists to interpret imaging results, and develop early mobilization plans that are tailored to the patient's specific injuries. This interdisciplinary collaboration ensures that the patient's rehabilitation begins as early as possible, reducing the risk of complications and promoting a faster recovery.

The Role of EMTs in Acute Trauma Management Prehospital Care and Initial Stabilization

EMTs are often the first healthcare professionals to arrive at the scene of a trauma, and their role in stabilizing the patient and ensuring safe transport to a healthcare facility is critical. In cases of suspected spinal cord injuries, for example, EMTs must immobilize the patient's spine to prevent further injury during transport (Oteir et al., 2014). The decisions made by EMTs in the first few minutes after an injury can have a significant impact on the patient's

long-term outcome.

Duong et al. (2018) highlight the importance of EMTs in managing trauma in older adults, who are particularly vulnerable to severe injuries from falls and other accidents. EMTs must be adept at assessing the severity of the injury, providing immediate care, and communicating effectively with the receiving hospital to ensure that the necessary resources are in place when the patient arrives. This coordination is essential in reducing the time to definitive care, which is a critical factor in improving outcomes in trauma cases.

Collaboration Between EMTs and Other Healthcare Professionals

The collaboration between EMTs and other healthcare professionals, such as radiologists and physiotherapists, begins in the prehospital setting. EMTs provide critical information about the patient's condition and the mechanism of injury, which helps inform subsequent imaging and treatment decisions. According to Purvis (2018), the evolution of prehospital care has emphasized the need for better integration between prehospital and hospital-based teams.

This integration ensures that trauma patients receive seamless care from the moment of injury through to rehabilitation.

By working closely with radiologists and physiotherapists, EMTs can help ensure that trauma patients receive the most appropriate care at every stage. For example, radiologists rely on the information provided by EMTs to determine the most appropriate imaging studies, while physiotherapists may use the EMT's assessment to develop early mobilization plans. This interdisciplinary approach improves the overall quality of care and reduces the risk of complications.

Geriatric Trauma and the Need for Specialized Care Demographics and Challenges in Geriatric Trauma

Trauma management in older adults presents unique challenges due to the increased prevalence of comorbidities and the decreased physiological reserve associated with aging.

Keller, Sciadini, Sinclair, and O'Toole (2012) explore the demographics and outcomes of geriatric trauma, noting that older adults are more likely to suffer from severe injuries, particularly from falls. The mortality rate in geriatric trauma patients is significantly higher than in younger patients, and the risk of complications is also increased.

Hashmi et al. (2014) identify several predictors of mortality in geriatric trauma patients, including the severity of the injury, preexisting medical conditions, and delays in receiving definitive care. This underscores the importance of a multidisciplinary approach in managing geriatric trauma. Radiologists, physiotherapists, and EMTs must work together to ensure that older adults receive timely and appropriate care, which may include more conservative management strategies or specialized rehabilitation programs tailored to the unique needs of this population.

Role of Interdisciplinary Collaboration in Geriatric Trauma Care

The interdisciplinary approach is particularly important in the management of geriatric trauma, where timely and accurate diagnosis, early mobilization, and careful monitoring are essential to improving outcomes. Radiologists play a key role in diagnosing fractures and other injuries, while physiotherapists focus on mobilizing the patient as early as possible to prevent complications such as pneumonia or deep vein thrombosis (Keller et al., 2012).

EMTs, on the other hand, are responsible for ensuring that the patient is safely transported to the hospital without exacerbating existing injuries.

Reeves et al. (2017) emphasize the importance of interprofessional collaboration in improving healthcare outcomes, noting that effective teamwork between different healthcare professionals can lead to better patient outcomes and more efficient use of

healthcare resources. In geriatric trauma cases, this collaboration is essential to ensure that the patient receives comprehensive care that addresses both their immediate injuries and their long-term rehabilitation needs.

Interprofessional Collaboration in Trauma Care Benefits of Interprofessional Collaboration

Interprofessional collaboration in trauma care has been shown to improve patient outcomes by enhancing communication and coordination between different healthcare professionals. Reeves, Pelone, Harrison, Goldman, and Zwarenstein (2017) conducted a systematic review of interprofessional collaboration interventions and found that these interventions resulted

in improved healthcare outcomes, including better adherence to clinical guidelines and more efficient use of healthcare resources.

In trauma care, where time is of the essence, effective collaboration between radiologists, physiotherapists, and EMTs can make the difference between life and death. Radiologists provide the diagnostic information needed to guide treatment decisions, while

physiotherapists ensure that the patient is mobilized as early as possible to prevent complications. EMTs, as the first responders, play a critical role in stabilizing the patient and ensuring that they receive appropriate care during transport.

Challenges in Implementing Interprofessional Collaboration

Despite the clear benefits of interprofessional collaboration, there are several challenges to implementing this approach in trauma care. One of the main challenges is the lack of standardized protocols for communication and collaboration between different healthcare professionals. Reeves et al. (2017) note that many healthcare systems lack the infrastructure needed to support effective interprofessional collaboration, leading to delays in care and poor patient outcomes.

Another challenge is the varying levels of training and experience among different healthcare professionals. For example, EMTs may have limited knowledge of advanced imaging techniques, while radiologists may not be familiar with the challenges of prehospital care. To address these challenges, healthcare systems must invest in training programs that emphasize the importance of interprofessional collaboration and provide healthcare professionals with the skills they need to work effectively as part of a team.

Conclusion

The interdisciplinary approach to trauma care, which integrates the expertise of radiologists, physiotherapists, and EMTs, is essential to improving patient outcomes in acute trauma cases. Radiologists provide the diagnostic imaging needed to guide treatment decisions, physiotherapists contribute to early mobilization and rehabilitation, and EMTs ensure that patients are stabilized and transported safely to healthcare facilities. Together, these

professionals form a cohesive team that can address the complex needs of trauma patients.

Interprofessional collaboration is the key to successful trauma management, as it ensures that all aspects of the patient's care are addressed in a timely and coordinated manner.

However, there are still challenges to implementing this approach, including the lack of standardized protocols and the need for additional training. By addressing these challenges, healthcare systems can improve the quality of care provided to trauma patients and reduce the risk of complications and mortality.

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